

Madison 6, Wis.
January 24, 1950.

Dear Kim-

I'm very sorry not to have had some more time (and data) to talk over the mechanism of UV killing with you. For the past couple of months, I've been doing some irradiation experiments on heterozygous diploids of *E. coli* with some rather peculiar results, and I'd like to compare notes with you.

First of all, no balanced lethal diploids have been found so far, even among survivors of rather high doses. This would already seem to preclude recessive lethal mutations as the mechanism of killing. Second, barring some unforeseen selective effects, heterogenic cells are made effectively isogenic, i.e., one recovers pure segregant colonies instead of mosaics. At 10% survival, ~~thus~~ a population originally 85% mosaic was converted to 25% mosaic. Although not yet formally proven, ~~th~~ I think this is not differential killing.

If these results stand up, they point to a new mechanism of killing, which may fit the alternatives that you think account for the bulk of UV effect in *Neurospora*. The chromosome or nucleus would be the unit of inactivation, the mutation being neither "dominant", i.e., affecting the entire or recessive, i.e., latent in the presence of homologous unaffected chromosomes.

This would show up in your material in much the same way that it does in *coli*, namely by induced segregations. Do you find appreciable increases in the numbers of homokaryotic conidia after irradiation? There was a strong indication of this in *N. tetrasperma* ascospores heterozygous for A/a and for yellow dwarf, after exposure to X-rays, as I think Esther and I may have mentioned at some time (also p. 157 of my Heredity review). So far, I haven't had an opportunity to test X-ray effects.

A few balanced lethals may be turning up in *coli*, but they are so rare, if at all, that they can scarcely account for an appreciable part of the killing. The "induced segregation" effect is, however, very striking, and I would appreciate it if you could tell me your experience.

Esther and I very much enjoyed our evening at your home, and we were refreshed for our trip. If it's not a secret, could we have the recipe for that chestnut dish that Barbara served? The Whitings were also an unexpected treat.

Sincerely,


Joshua Lederberg

P.S.-- How'd you like that tricky reasoning of Opatowski's in the last Genetics? What a fast one.